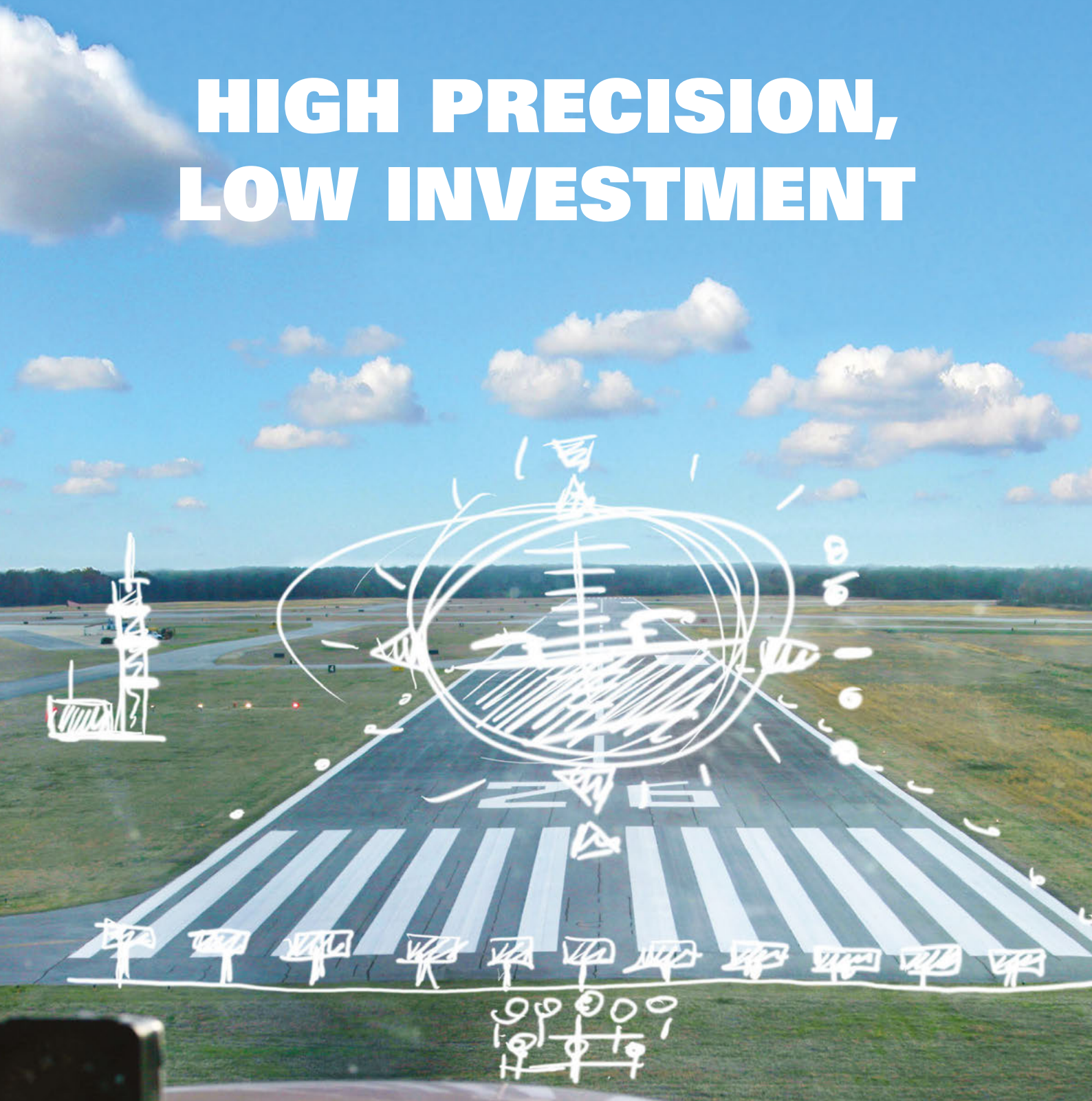


HIGH PRECISION, LOW INVESTMENT





European skies are becoming increasingly congested, as are Europe's major airports. With air traffic continuing to grow, there is increasing pressure for small and regional airports to be safely accessible at all times – which cannot be achieved by relying solely on non-precision approaches.

Air Traffic Management (ATM) needs to evolve from the costly and inflexible ground based infrastructures of today towards more advanced systems based on new technology.

EGNOS, the **European Geostationary Navigation Overlay Service**, offers enhanced vertical **precision** and **integrity**, improving **accessibility**, **efficiency**, and **safety** to operators, pilots and airports across Europe.

EGNOS, the **European Satellite Based Augmentation System** (SBAS), was certified for civil aviation in March 2011. It enhances:

Accessibility

Increased accuracy and integrity means the decision height can be decreased to as low as 200 ft, depending on local geography.

With an EGNOS procedure, even small and medium-sized airports and heliports remain accessible in poor weather conditions. Plus, the lower decision height provided by EGNOS may open up approach paths to runway ends previously inaccessible due to local obstacles.

Publishing EGNOS procedures can:

- Offer airports a competitive edge over those only offering non-precision approaches.
- Significantly enhance the effectiveness of helicopter emergency medical services by increasing the accessibility of heliports.

Sustainability

In many cases, EGNOS reduces aviation's environmental impact. It enables curved approaches and continuous descent paths, reducing both noise and emissions. For helicopters, EGNOS allows approach procedures to be developed from any direction, and at steeper approach angles than classic fixed wing procedures, creating the possibility to avoid densely populated areas.



LPV-200: The Facts

LPV-200 utilises EGNOS to deliver accurate information on an aircraft's approach.

LPV-200 based approaches:

- Allow lateral and angular vertical guidance without the need for visual contact with the ground until a Decision Height of down to only 200 feet above the runway.
- Are operationally equivalent to ILS CAT I, no need for expensive ground infrastructure.

- Are free of charge within the service coverage area, no upgrade to an airport's ground infrastructure or to existing certified EGNOS receivers is required.
- Increased capacity and reduction of both ATC and pilot workloads.
- Increased airspace capacity to airports, particularly the small and regional airports.

Pilots can now land an aircraft more efficiently and safely, especially in bad weather conditions, thus reducing delays, diversions and cancellations.



Efficiency

EGNOS provides a cost effective alternative to ILS CAT I, offering similar performance without the need for infrastructure installation and maintenance.

With EGNOS, a lower decision height can also considerably reduce costly delays, diversions and cancellations. This can even allow other ground nav aids to be phased out, possibly reducing landing fees.

All that is needed is an on-board EGNOS certified receiver, trained crew, an adapted approach procedure for the runway, and corresponding flight management system functions.

With the introduction of ADS-B, more and more EGNOS certified receivers are available on the market, and many aircraft and rotorcraft manufacturers offer EGNOS capabilities as a standard fit in their new models. For older models, many retrofit and STC solutions are already available. Furthermore, in the near future EGNOS based approaches will be taught to new pilot students as part of the standard instrument rating training.

Safety

Increased vertical accuracy provided by EGNOS improves safety by:

- Reducing the occurrence of Controlled Flight into Terrain by as much as 75 %.
- Acting as a backup system for approaches into airports that already offer precision approaches.
- Allowing the design of more flexible and safer approach procedures for rotorcraft.

EGNOS enables the implementation of safe approach procedures specifically designed for helicopters. For example, EGNOS enables safer approaches to hospitals.



EGNOS-BASED APPROACH PROCEDURES

- Planned Aerodromes
- Operational Aerodromes
- Planned Heliports
- Operational Heliports



EGNOS Ground Segment

- Mission Control Center
- Navigation Land Earth Station
- Support Facilities
- Ranging and Integrity Monitoring Station (Deployed)
- Ranging and Integrity Monitoring Station (Under deployment)
- Ranging and Integrity Monitoring Station (On Test)

How it works

EGNOS, the European Geostationary Navigation Overlay Service, improves the accuracy of position measurements by sending out signals that correct GPS data and provide information on its reliability.

The EGNOS network includes about 40 reference stations in more than 20 countries. These reference stations pick up signals from GPS satellites, which are processed in Master Control Centres (MCC). The accuracy of the original signals is determined and confounding factors, such as electrical disturbances in the atmosphere, are corrected.

This data is incorporated into EGNOS signals and sent to its three geostationary satellites. The satellites then relay the signals back to EGNOS-enabled receivers, thus providing far greater positioning accuracy than would be achieved through GPS alone.

In Europe, ICAO recommends deploying APV approaches on all runways by 2016, and EGNOS is included in the regional PBN plan.

EGNOS-enabled receivers are widely available thanks to its compatibility with the proven US WAAS system, with over 55,000 aviation receivers already in use. In the US, as of December 2010, there were over 3,000 published WAAS LPVs, outnumbering the number of Instrument Landing System (ILS) procedures.

The EGNOS signal may be used for approaches using a certified receiver, FMS and SBAS procedure.

The EGNOS signal is free and is here to stay. EGNOS has been certified for civil aviation since 2011 and its geographic reach has – and continues to be – extended.

EGNOS can provide accessibility, cost and safety savings in a single, proven solution, by delivering high precision with a low investment.

For more information, please visit:
www.egnos-portal.eu